

What is claimed is:

1. A method of tracking an object comprising:

providing a plurality of cameras;

determining an image from each camera;

5 determining a common plane in the images;

determining a parallax for scene points across the images;

incorporating the parallax as a feature in a background

model; and

estimating a change in the scene using the background

10 model.

2. The method of claim 1, wherein at least one camera is a
pan-tilt-zoom camera.

15 3. The method of claim 1, wherein at least one camera is
uncalibrated.

4. The method of claim 2, further comprising:

providing a pan-tilt-zoom camera;

20 determining a mosaic for the pan-tilt-zoom camera from
images captured from the pan-tilt-zoom camera; and

registering the mosaic and the images from the pan-tilt-
zoom camera and the plurality of cameras according to a common
plane in the scene.

5. The method of claim 2, further comprising inter-frame registration of images captured from the pan-tilt-zoom camera.

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6. The method of claim 1, wherein the background model comprises a feature.

10 7. The method of claim 6, wherein the feature is one of an intensity and an edge.

8. The method of claim 1, further comprising determining the background model by one of a mixture-of-Gaussians and a non-parametric kernel.

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9. The method of claim 1, further comprising determining a change according to the background model.

20 10. The method of claim 1, further comprising obtaining a height from the parallax that is invariant to the motion of the object through the scene.

11. The method of claim 1, further comprising providing a

control strategy for controlling the cameras such that a probability of the object being visible in a next image is maximized.

5 12. The method of claim 8, wherein an error associated with object detection and velocity is propagated to determine a maximum possible zoom at which an image of the desired region of the object may be acquired.

10 13. The method of claim 1, further comprising obtaining a relationship between observations from different cameras via a homography relationship for the common registered plane.

15 14. The method of claim 1, further comprising providing a control strategy for acquiring user defined relevant information for a plurality number of objects in a scene.

15. The method of claim 14, wherein providing the control strategy further comprises:

20 providing a probability density function for the object;
and
 providing a model for object motion.

16. The method of claim 14, wherein providing the control

strategy further comprises providing a user specification.

17. The method of claim 16, further comprising controlling the cameras according to the user specification and the change in the scene.

18. A system for tracking an object, comprising:

two or more cameras;

a registration module for aligning a common plane in an image obtained from each camera;

a parallax module for determining a parallax between views of each camera; and

a detection module for determining an object in a scene defined by the views of the cameras according to the parallax and a predetermined background model.

19. The system of claim 18, wherein the parallax is determined between views of two cameras.

20. The system of claim 18, wherein at least one camera is uncalibrated.

21. The system of claim 18, wherein at least one camera is a pan-tilt-zoom camera.

22. The system of claim 20, further comprising control strategy means for tracking the object with the pan-tilt-zoom camera.

5 23. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for tracking an object, the method steps comprising:

providing a plurality of cameras;

10 determining an image from each camera;

determining a common plane in the images;

determining a parallax for scene points across the images;

incorporating the parallax as a feature in a background model; and

15 estimating a change in the scene using the background model.